

REMARKS

Status of the Application

Applicant respectfully requests reconsideration of the rejections set forth in the Office Action mailed on March 12, 2003.

- The Examiner has rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,420,779 to *Sharma et al.* (*Sharma*) in view of U.S. Patent No. 6,208,023 to *Nakayama et al.* (*Nakayama*); the Examiner has also rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over *Nakayama* in view of U.S. Patent No. 6,166,430 to *Yamaguchi* (*Yamaguchi*).
- The Examiner has rejected claim 6 under 35 U.S.C. § 102(e) as being anticipated by *Nakayama*; the Examiner has also rejected claim 6 under 35 U.S.C. § 103(a) as being unpatentable over *Sharma* in view of *Nakayama*.

Claims 1-10 are pending in the current application.

The Claims

Please cancel claim 11.

Claim 1

First rejection under 35 U.S.C. § 103(a)

The Examiner has rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over *Sharma* in view of *Nakayama*.

Sharma and *Nakayama* do not teach all elements of amended claim 1, even in combination. Amended claim 1 requires a metal slug that extends beyond the bottom surfaces of a plurality of leads. In contrast, *Sharma* teaches a device 100 with a die pad that is coplanar with the bottom surface 142 of leads 140 (Col. 3:64-4:1). Similarly, as stated above, *Nakayama* discloses a die pad 12 whose lower surface is coplanar with the bottom faces of the leads 15. In neither *Sharma* nor *Nakayama* does the die pad extend *beyond* the bottom surfaces of a plurality of leads.

Second rejection under 35 U.S.C. § 103(a)

The Examiner has also rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over *Nakayama* in view of *Yamaguchi*.

Nakayama and *Yamaguchi* do not teach all elements of amended claim 1, even in combination. Amended claim 1 recites a metal slug that extends beyond the bottom faces of a plurality of leads. As above however, *Nakayama* discloses a die pad 12 whose lower surface is

coplanar with the lower surfaces of the leads 15, and does not extend beyond them. Similarly, *Yamaguchi* teaches a semiconductor device having external terminals 20 and a die pad 14. The external terminals 20 and die pad 14 both extend a single standoff height from the device, for connection to a planar motherboard (Col. 10:8-13; Fig. 5(c)). The die pad 14 does not extend beyond the bottom faces of terminals 20. In neither *Nakayama* nor *Yamaguchi* do the die pads extend *beyond* the bottom faces of a plurality of leads.

Claim 6

Rejection under 35 U.S.C. § 102(e)

The Examiner has rejected claim 6 under 35 U.S.C. § 102(e) as being anticipated by *Nakayama*.

Nakayama does not disclose all limitations of amended claim 6. Specifically, *Nakayama* fails to disclose a metal slug that is not formed from a lead frame.

Amended claim 6 requires a metal slug that is not formed from a lead frame. For example, the invention discloses a metal slug 104 that is spaced apart from the lead frame 110 by spacers 107. The metal slug 104 is separate from, and clearly not formed from, the lead frame 110. In contrast, *Nakayama* discloses a lead frame with no separate metal slug. There, the semiconductor chip 11 is bonded to a die pad 12 that is integral with the lead frame – the die pad 12 and the first leads 14 are a single structure. No separate metal slug even exists. In essence, the chip 11 is bonded to a portion of the lead frame, not to a separate metal slug. As a result, *Nakayama* does not teach the limitations of claim 6, as it fails to disclose a metal slug that is not formed from the lead frame. Applicant thus submits that claim 6 is patentable over the cited art for at least the reason stated.

Rejection under 35 U.S.C. § 103(a)

The Examiner has also rejected claim 6 under 35 U.S.C. § 103(a) as being unpatentable over *Sharma* in view of *Nakayama*.

Sharma and *Nakayama* do not teach all elements of amended claim 6, even in combination. As stated above, *Nakayama* does not disclose a separate metal slug. Instead, its chip 11 is bonded directly to a portion of the lead frame. No metal slug exists separate from the lead frame. Similarly, *Sharma* (Fig. 2) discloses a die pad 120 that is formed from the same structure as at least some leads 130 (i.e., the diagonal leads 130 of Fig. 2). *Sharma* thus also does not disclose a separate metal slug. The IC 110 is bonded to the die pad, which is an integral component of the lead frame. Thus, unlike the current invention, no metal slug exists separate from the lead frame. As *Sharma* and *Nakayama* both fail to disclose a metal slug that is separate (not formed) from a lead frame, Applicant submits that claim 6 is patentable over the cited art for at least the reason stated.

Claims 2 and 7

Claims 2 and 7 are objected to as being dependent upon rejected base claims, but would be allowable if rewritten in independent form including the limitations of claims 1 and 6, respectively. Consequently, claims 2 and 7 have been rewritten to include the limitations of claims 1 and 6, respectively. It is therefore submitted that claims 2 and 7 are now allowable.

Claims 3-5 and 8-10


Claims 3-5 depend from claim 2, and claims 8-10 depend from claim 7. As claims 2 and 7 have been rewritten in independent form to make them allowable, Applicant respectfully submits that claims 2-5 and 8-10 are also now allowable.

Newly added Claim 12

Newly added claim 12 depends from claim 6, and is therefore patentable for at least the same reasons claims 6 is patentable.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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